

In recognition of his long and distinguished service and his notable contributions to man's knowledge and understanding of the weather, a dinner was given Professor McAdie on June 11 by the Harvard visiting committee to Blue Hill Observatory, and a silver bowl was presented

to him and Mrs. McAdie as a token of the committee's affection. Professor and Mrs. McAdie will make their home at Hampton, Va.—(*Bulletin American Meteorological Society August-September, 1931, p. 158.*)

BIBLIOGRAPHY

C. FITZUGH TALMAN, in charge of Library

RECENT ADDITIONS

The following have been selected from among the titles of books recently received as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies:

American geophysical union.
Twelfth annual meeting. Transactions. April 30 and May 1, 1931. Washington, D. C. Washington. 1931. 229 p. figs. 25 cm.

Beaugé,
Contribution à l'étude des relations de la météorologie et de l'océanographie. p. 1052-1063. figs. 27½ cm. (Bull. Soc. d'océan. de France. 11e année. 15 mars, 15 mai 1931.)

Crestani, Giuseppe.
Climatologia. Torino. 1931. xi, 359 p. figs. 27½ cm. (Trat. ital. d'igiene, dir. Oddo Casagrandi. Monografia 17a.)

Eredia, Filippo.
Cenni sulle condizioni termiche della regione italiana, nei riguardi dell'irrigazione. Roma. 1931. 12 p. fig. 25½ cm. (Estr.: Le irrig. in Italia. Pub. no. 8 del Serv. idrog. II ed.)

Froc, L.
History of the code of Zi-ka-wei. 4 p. chart (fold.) 31½ cm. (Report presented by Rev. F. L. Froc at conference of directors of meteorological stations of the Far East, held at Hong Kong at the end of April, 1930.)

Gherzi, E.
Winds and the upper air currents along the China coast and in the Yangtse valley. Shanghai. 1931. 2,240 p. plates. 31½ cm.

Gorton, A. F.
Significance of cyclical characteristics in long range weather forecasting. p. 10-11, 27. 26 cm. (Citrus leaves, Aug. 1931.)

[Great Britain.] **Air ministry.**
Manual of air pilotage. London. 1930. xviii, 248 p. illus. maps (fold.) 23 cm. (Air pub. 1234.)
Report of the R. 101 inquiry . . . London. 1931. 129 p. figs. maps (fold.) front. 24½ cm.

Gunness, C. I.
Meteorological records. A forty-year summary, 1889-1928. p. 209-226. 23 cm. (Mass. agr. exper. sta. Bull. no. 270. Dec. 1930.)

Kendrew, Wilfrid George.
Climate, a treatise on the principles of weather and climate. Oxford. 1930. x, 329 p. illus. plates. diags. 22½ cm.

Knowlton, H. E., & Dorsey, M. J.
Study of the hardness of the fruit buds of the peach. 28 p. illus. 23 cm. (Agr. exper. sta., coll. of agric. West Va. Univ. bull. 211. Dec., 1927.)

Mangin, Arthur.
L'air et le monde aérien. 3. éd., entièrement refondue d'après les travaux scientifiques les plus récents . . . Tours. 1877. 574 p. illus. plates. 24½ cm.

Montanari, D.
Sulla determinazione di correnti verticali per mezzo di palloni piloti. Roma. 1931. 10 p. figs. 24½ cm. (Estr.: L'Aerotecnica. v. 11, N. 3. Marzo 1931 IX.)

Monterin, Umberto.]
Ricerche sull'ablazione e sul deflusso glaciale nel versante meridionale del Monte Rosa. Roma. 1931. 75 p. figs. plate (fold.) 27 cm. (Uff. idrog. del Po. Pubb. N. 10. Fasc. 6°.)

Petitjean, L.
Le temps et la prévision du temps en Algérie et au Sahara. Paris. 1930. 71 p. figs. maps (fold.) 24 cm. (1830-1930 coll. du cent. de l'Algérie. Études scient. Serv. mét. de l'Algérie.)

Richardson, Burt.
Evaporation as a function of insolation. p. 996-1019. 23 cm. (Amer. soc. civil engin. Trans. v. 95, 1931.)

Skeete, C. C.
West Indian hurricanes. p. 178-185, 206-210. figs. 28 cm. (Tropical agric., v. 8, no. 7-8, July-Aug. 1931.)

Terada, Torahiko, & Utigasaki, Tyokurô.
Physical investigations of conflagrations in Tokyo. p. 69-90. figs. 26½ cm. (Sci. papers Inst. phys. & chem. res. v. 16, Aug. 1931.)

Tutton, A. E. H.
High Alps; a natural history of ice and snow. London. [1931.] xvi, 319 p. figs. plates. 22½ cm.

Watanabe, M., & others.
Report on the cloud observations made at the Mera meteorological observatory, Mera, near Tokyo. April 1927 to March 1929. Tokyo. 1931. 50, 72 p. figs. plates. 31 cm.

SOLAR OBSERVATIONS

SOLAR RADIATION MEASUREMENTS DURING JULY, 1931

By HERBERT H. KIMBALL, Solar Radiation Investigations

For a description of instruments employed and their exposures, the reader is referred to the January, 1931, REVIEW, page 41.

Table 1 shows that solar radiation intensities averaged above the normal intensities for July at Madison, and close to the July normals at Washington and Lincoln.

Table 2 shows an excess in the total radiation received on a horizontal surface as compared with the normal amounts for July at Madison and Fresno, and a deficiency at all other stations for which normals have been computed.

Skylight polarization measurements obtained on 8 days at Madison, give a mean of 60 per cent with a maximum of 70 per cent on the 24th. At Washington, measurements obtained on 4 days give a mean of 53 per cent, with a maximum of 58 per cent on the 27th. These are close to the corresponding July averages for both stations.

TABLE 1.—Solar radiation intensities during July, 1931
[Gram-calories per minute per square centimeter of normal surface]
Washington, D. C.

Date	Sun's zenith distance										Local mean solar time	
	8 a.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°		Noon
	75th mer. time	Air mass										
		A. M.					P. M.					
e.	5.0	4.0	3.0	2.0	1.0	2.0	3.0	4.0	5.0	e.		
July 8.....	mm. 17.37	cal. -----	cal. -----	cal. -----	cal. 0.72	cal. -----	cal. -----	cal. -----	cal. -----	mm. 18.59		
July 11.....	14.10	-----	-----	0.78	0.99	1.26	-----	-----	-----	10.97		
July 14.....	19.23	-----	-----	-----	0.82	1.14	-----	-----	-----	20.57		
July 15.....	17.96	-----	-----	-----	0.74	-----	-----	-----	-----	17.96		
July 22.....	13.61	-----	-----	-----	1.09	1.32	-----	-----	-----	13.13		
July 23.....	13.61	-----	-----	0.78	0.99	1.17	-----	-----	-----	13.61		
July 25.....	13.13	-----	-----	0.76	0.98	1.25	-----	-----	-----	8.81		
July 27.....	16.79	-----	0.63	0.80	1.00	1.18	-----	-----	-----	10.97		
July 28.....	18.59	-----	-----	-----	0.82	1.14	-----	-----	-----	14.60		
July 29.....	19.89	-----	-----	0.84	0.88	-----	-----	-----	-----	14.60		
Means.....	-----	-----	(0.63)	0.79	0.90	1.21	-----	-----	-----	-----		
Departures...	-----	-----	-0.04	+0.02	±0.00	+0.02	-----	-----	-----	-----		

¹ Extrapolated.

TABLE 1.—Solar radiation intensities during July, 1931—Contd.

Madison, Wis.

Date	Sun's zenith distance											Local mean solar time
	8 a.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noon	
	Air mass											
	A. M.					P. M.						
75th mer. time	e.	5.0	4.0	3.0	2.0	1.0	2.0	3.0	4.0	5.0	e.	
July 1	17.96	cal.	0.54	0.69	0.85	1.12	1.39	1.14	0.95			18.79
July 6	12.24		1.01	1.12	1.25	1.39	1.14	0.95				10.51
July 7	9.47						1.44	1.17	0.94			6.76
July 8	10.21	0.85	0.91	0.99	1.16	1.40						9.83
July 9	8.31	0.81	0.94	1.02								7.29
July 10	6.27				0.96	1.36						7.87
July 11	8.51				0.91	0.71						16.79
July 14	16.20			0.74	0.91							17.37
July 15	15.65					1.14	0.91	0.71				16.20
July 16	15.95		0.73	0.87	1.04							9.14
July 18	10.59					1.45						10.59
July 21	10.59					1.23						9.83
July 22	10.97					1.39	1.16	1.03				6.76
July 24	10.59		0.92	1.06	1.23	1.42	1.10	0.95	0.77			9.83
July 25	10.97			0.92	1.04							
Means		(0.83)	0.84	0.93	1.06	1.33	1.10	0.92	(0.77)			
Departures		+0.12	+0.04	+0.02	±0.00	+0.05	+0.08	+0.01				

Lincoln, Nebr.

July 13	14.60				1.28	1.02	0.81	0.67			17.37
July 14	14.60	0.65	0.78	0.98	1.23	0.94	0.75				17.37
July 16	17.37		0.93	1.14	1.36						17.37
July 20	13.13					1.16	0.97	0.80			11.38
July 21	12.24			0.93	1.13	1.35					11.38
July 23	11.38				1.36	1.15	0.99	0.84			9.47
July 24	10.97		0.84	0.96	1.10						9.14
July 25	12.68		0.77	0.85	1.04	1.21	1.07	0.88	0.73		12.24
July 27	19.23		0.72	0.85	1.06	1.30	1.00	0.81	0.64		17.96
Means		0.74	0.88	1.08	1.30	1.06	0.87	0.74			
Departures		-0.04	-0.01	±0.00	-0.02	±0.00	-0.01	+0.01			

TABLE 2.—Total solar radiation (direct diffuse) received on a horizontal surface

[Gram-calories per square centimeter]

Week beginning—	AVERAGE DAILY TOTALS											
	Washington	Madison	Lincoln	Chicago	New York	Twin Falls	Pittsburgh	Gainesville	Fresno	La Jolla	Miami	New Orleans
1931	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.
July 2	418	533	507	424	316	709	453	464	726	360	604	403
July 9	475	542	549	406	403	655	442	1 287	754	387	589	272
July 16	444	587	527	403	338	624	393		708	345	564	349
July 23	583	574	607	464	415	455	550	440	619	423	593	279
DEPARTURES FROM WEEKLY NORMALS												
July 2	-84	+1	-71	-14	-97	+48	-31	-14	+12	-96		
July 9	-11	+10	-23	-19	+1	-37	-39	-205	+46	-73		
July 16	-300	+72	-41	-10	-60	-56	-83		+8	-123		
July 23	+97	+74	+62	+65	+17	-186	+48	-106	-59	-22		
Accumulated departures on July 29, 1931	+1265	-3192	-77	-1169	-1190	-1063	-1863	-2823	-266	-4872		

¹ 5-day mean.

POSITIONS AND AREAS OF SUN SPOTS

[Communicated by Capt. J. F. Hellweg, Superintendent United States Naval Observatory. Data furnished by Naval Observatory, in cooperation with Harvard, Yerkes, Perkins, and Mount Wilson observatories. The differences of longitude are measured from central meridian, positive west. The north latitudes are plus. Areas are corrected for foreshortening and are expressed in millionths of sun's visible hemisphere. The total area, including spots and groups is given for each day in the last column]

Date	Eastern stand-ard civil time	Heliographic			Area		Total area for each day
		Diff. long.	Longi-tude	Lati-tude	Spot	Group	
1931	h m	°	°	°			
July 1 (Naval Observatory)	10 50	-52.0	74.4	+6.0	154		216
July 2 (Naval Observatory)	11 57	-42.0	84.4	-10.0	62		77
July 3 (Naval Observatory)	10 56	-35.0	77.6	+5.0	77		77
July 4 (Mount Wilson)	12 45	-22.0	77.9	+5.0			16
		-13.0	72.6	+5.0			64
		0.0	85.6	-8.0			

Positions and areas of sun spots—Continued

Date	Eastern stand-ard civil time	Heliographic			Area		Total area for each day
		Diff. long.	Longi-tude	Lati-tude	Spot	Group	
1931	h m	°	°	°			
July 5 (Naval Observatory)	10 48	-3.0	70.5	+5.0		31	62
July 6 (Naval Observatory)	13 22	+11.0	84.5	+6.0		31	62
		-31.0	27.8	+8.0	3		96
		+4.0	62.8	+9.0		62	96
		+27.0	85.8	+5.0		93	186
July 7 (Naval Observatory)	11 2	-62.0	344.9	-21.0		62	186
		-39.5	7.4	-9.0		93	
		+5.0	51.9	+11.5		31	186
July 8 (Naval Observatory)	11 13	-78.0	315.6	-13.0		62	
		-50.0	343.6	-22.0	31		108
		-25.0	8.6	-9.0		108	
		+12.0	45.6	-3.0	15		216
July 9 (Perkins Observatory)	13 30	-93.0	296.0	-5.0	100		256
		-79.0	300.0	+1.0	93		
		-29.0	350.0	-11.0	93		256
July 10 (Naval Observatory)	16 32	-50.0	314.2	-11.5		77	
		-21.0	343.2	-21.0	15		
		-8.0	356.2	-19.0	15		184
		+7.5	11.7	-8.0		77	
July 11 (Naval Observatory)	10 43	-38.0	316.1	-12.0		31	
		+3.0	357.1	-20.0	6		52
		+19.5	13.6	-8.0	15		
July 12 (Mount Wilson)	11 50	-24.0	316.3	-12.0	18		
		-8.0	332.3	+5.0	3		
		+15.0	355.3	-19.0		44	
		+33.0	13.3	-8.0		36	101
July 13 (Naval Observatory)	10 58	-10.5	317.0	-12.0	9		
		-0.1	327.4	+0.5	3		
		+4.0	331.5	+15.0	3		
		+25.0	352.5	+17.0	3		
		+30.0	357.5	-20.0	6		30
		+49.0	16.5	-7.5	6		
July 14 (Naval Observatory)	11 35	-55.0	258.9	+12.0	3		
		-46.0	267.9	+17.0	3		
		+4.5	318.4	-12.0	9		
		+7.5	321.4	+13.0	3		
		+16.0	329.9	-16.0	3		
		+43.0	356.9	-19.5	3		
		+66.0	18.9	-8.0	6		30
July 15 (Naval Observatory)	10 53	-13.0	288.1	-16.0	3		
		+12.0	313.1	-15.0	3		
		+16.0	317.1	+9.5	3		
		+18.0	319.1	-13.0	9		18
		+29.0	316.8	-8.0	6		6
July 16 (Naval Observatory)	10 41	+7.5	282.3	+8.0		9	9
July 17 (Naval Observatory)	10 32	No spots					
July 18 (Naval Observatory)	10 32	No spots					
July 19 (Naval Observatory)	10 55	No spots					
July 20 (Naval Observatory)	10 54	No spots					
July 21 (Naval Observatory)	10 41	-62.0	159.8	+7.5		31	31
July 22 (Naval Observatory)	11 6	-49.5	158.9	+8.0		45	45
July 23 (Naval Observatory)	10 56	-33.0	162.2	+8.0		15	
		-14.0	181.2	-4.0	6		
		-9.5	185.7	+2.5	6		
		-0.5	194.7	+23.0		22	49
July 24 (Naval Observatory)	13 48	-19.5	160.9	+6.5		15	15
July 25 (Naval Observatory)	10 40	No spots					
July 26 (Naval Observatory)	10 50	-80.0	75.6	+7.0		31	31
July 27 (Naval Observatory)	10 49	-62.0	80.4	+7.0		31	31
July 28 (Naval Observatory)	10 45	-52.0	77.2	+5.0		62	
		+40.0	169.2	-1.5	15		77
July 29 (Naval Observatory)	10 50	-43.0	72.9	+12.0	9		
		-38.0	77.9	+7.0	37		
		+59.0	174.9	-7.0	6		52
July 30 (Naval Observatory)	10 36	-25.0	77.8	+8.0		108	
		-18.0	84.8	-6.0		62	170
July 31 (Naval Observatory)	10 50	-11.0	78.5	+7.0		93	
		-3.5	86.0	-6.0		77	170
Mean daily area for July							77

PROVISIONAL SUN-SPOT RELATIVE NUMBERS FOR JULY, 1931

[Data furnished through the courtesy of Prof. W. Brunner, University of Zurich Switzerland]

July, 1931	Relative numbers	July, 1931	Relative numbers	July, 1931	Relative numbers
1	22	11	35	21	Ec 7
2	23	12	26	22	10
3	23	13	30	23	8
4	19	14	23	24	8
5	a 19	15	8	25	8
6	16	16	7	26	0
7	Ec	17	8	27	Ec 7
8	35	18	7	28	9
9	28	19	0	29	Ec 22
10	Mac 48	20	0	30	23
				31	23

Mean: 30 days=16.7.

a= Passage of an average-sized group through the central meridian.
 b= Passage of a large group or spot through the central meridian.
 c= New formation of a center of activity: E, on the eastern part of the sun's disk; W, on the western part; M, in the central zone.
 d= Entrance of a large or average-sized center of activity on the east limb.